

WE CLAIM:

5 1. A method of 3D measurement, evaluation and grading system for fabric/textile structure/garment appearance, the method comprising using a fixed digital camera positioned above a piece of the fabric, shining at least two different parallel light beams from inclined directions on to the surface and capturing different  
10 reflected images of the surface with the camera, analysing the captured images to derive values of parameters of the surface based on the intensities of light reflected from a number of evenly distributed points of the surface.

15 2. A method of 3D measurement, evaluation and grading system for fabric/textile structure/garment appearance according to claim 1, including using four different parallel light beams.

20 3. Apparatus for 3D measurement, evaluation and grading system for fabric/textile structure/garment appearance, the apparatus including a digital camera arranged to be mounted above a piece of fabric, means to  
25 shine at least two inclined different parallel beams onto a surface of the fabric below the camera, means for analysing images of the fabric captured by the camera, and a computer programmed to derive values of P and Q from the captured images, where P and Q are summations

of surface gradients for a plurality of evenly distributed points in an x direction and in a y direction respectively.

5 4. A method of grading fabric/textile structure appearance based on values P and Q, the method comprises using a fixed digital camera positioned above a piece of the fabric, shining at least two different parallel light beams from inclined directions on to the surface and capturing different reflected images of the surface  
10 with the camera, analysing the captured images to derive values of P and Q, where P and Q are summations of surface gradients for a plurality of evenly distributed points in an x direction and in a y direction respectively, and calibrating  $P + Q$  against a subjective  
15 grade analysis of the fabric, and thereafter using calibrated P and Q to determine the grades of fabric.

20 5. A method of grading fabric/textile structure appearance according to claim 4, including using four different parallel light beams.

6. A method of grading fabric/textile structure appearance according to claim 4, in which the surface  
25 gradients p and q are derived using equations (7).

7. Apparatus for 3D measurement, evaluation and grading system for fabric/textile structure/garment

appearance including a digital camera arranged to be  
mounted above a piece of fabric, means to separately  
shine at least two inclined different parallel beams  
onto a surface of the fabric below the camera, means for  
5 analysing separate images of the fabric captured by the  
camera for each light beam respectively, and a computer  
programmed to derive values of parameters of the surface  
based on the intensities of light reflected from a  
number of evenly distributed points of the surface.

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8. Apparatus for 3D measurement, evaluation and  
grading system for fabric/textile structure/garment  
appearance according to claim 8, including means for  
separately shining four inclined different parallel  
15 light beams evenly distributed with respect to the  
camera.